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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,082	07/05/2001	Tadatomo Suga	925-203	3209

7590 08/21/2002

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EXAMINER

NGUYEN, JOSEPH H

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 08/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/898,082

Applicant(s)

SUGA, TADATOMO

Examiner

Joseph Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-9 and 20-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3-9 and 20-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-9, 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawai et al.

Regarding claim 1, Kawai et al discloses on figure 12c a semiconductor device comprising a first portion comprising a first substrate, a conductive layer 4, 2 and an insulating layer 1 laminated on the first substrate and a bonding surface that is chemically mechanically polished and exposes a conductive region and insulating region; wherein the conductive region includes a concave surface defining a dishing portion; a second portion comprising a second substrate, a conductive layer 4, 2 and an insulating layer laminated on the second substrate and a bonding surface that is chemically mechanically polished and exposes at least a conductive region having a concave surface defining a dishing portion; and wherein the bonding surface of the first portion and the bonding surface of the second portion are solid state bonded to each other so that the dishing portions of the conductive regions of the respective first and second portions are bonded to each other so as to contact one another; and at least one of the bonding surface of the first portion and the bonding surface of the second portion has the insulating region 1 lowered with respect to the conductive region 4, 2.

Regarding claim 3, Kawai et al discloses on figure 12c the conductive region 4, 2 of the first portion and the conductive region 4, 2 of the second portion are solid state bonded to each other, and the insulating region 1 of the first portion and the insulating region 1 of the second portion face each other with interposition of a clearance 8.

Regarding claim 4, Kawai et al discloses on figure 12c the insulating region 1 that surrounds the conductive region 4, 2 of the first portion and the insulating region 1 that surrounds the conductive region 4,2 of the second portion face each other with interposition of a clearance.

Regarding claim 5, Kawai et al discloses on figure 12c the conductive region 4,2 of the first portion and the conductive region 4, 2 of the second portion are solid state bonded to each other, and the insulating region 1 of the first portion and the insulating region 1 of the second portion are put in contact with or solid state bonded to each other.

Regarding claim 6, Kawai et al discloses on figure 12c the insulating region 1 that surrounds the conductive region 4, 2 of the first portion and the insulating region 1 that surrounds the conductive region 4, 2 of the second portion are put in contact with or solid state bonded to each other.

Regarding claim 7, Kawai et al discloses on figure 12c the conductive regions 4, 2 are end surfaces of through hole conductors and the insulating regions 1 are end surfaces of through hole insulators that surround that respective through hole conductors.

Regarding claim 8, Kawai et al discloses on figure 12c the conductive regions 4,2 are end surfaces of through hole conductors and the insulating regions are end surfaces of through hole insulators that surround the respective through hole conductors.

Regarding claim 9, Kawai et al discloses that the first substrate or the second substrate is any one of a semiconductor substrate, an inorganic substrate and an organic substrate.

Regarding claim 20, Kawai et al discloses on figure 12c a semiconductor device comprising a first substrate supporting a first insulating layer 1 with a contact hole define therein, and a first conductive material 4, 5 filling in the contact hole in the first insulating layer and protruding above a surface of the first insulating layer 1; a second substrate supporting a second insulating layer 1 with a contact hole defined therein, and second conductive material 4, 2 filling in the contact hole in the second insulating layer 1; and wherein the first conductive material that fills in the contact hole in the first insulating layer and the second conductive material that fills in the contact hole in the second insulating layer are solid state bonded to each other so as to contact one another in/ a bonded state.

Regarding claim 21, Kawai et al disclose on figure 12c the second conductive material 4, 2 filling in the contact hole in the second insulating layer protrudes above a surface of the second insulating layer.

Regarding claim 22, Kawai et al disclose on figure 12c the first and second conductive materials are of the same material.

Regarding claim 23, Kawai et al disclose on figure 12c concave surfaces of the respective first and second conductive materials are bonded to one another so as to contact each other.

Regarding claim 24, Kawai et al disclose on figure 12c a gap or clearance 8 is defined between the first and second insulating layers adjacent an area where the conductive materials are solid state bonded to one another.

Response to Arguments

Applicant's arguments filed on 6/19/2002 have been fully considered but they are not persuasive.

With respect to claim 1, applicant argues that Kawai significantly differs from the invention of claim 1 in that the Cu material, which fills through hole 4 in Kawai, does not have a dishing portion (i.e., it has no concave shaped surface). However, the concave shaped surface only appears during the manufacturing process (i.e., bonding). The concave shaped surface no longer exists in the final product (i.e., figure 4 of the present application). Therefore, since the claim appears to be defining a final product, the intermediate concave shaped surface does not structurally distinguish over Kawai et al.

With respect to new claim 20, applicant argues that in Kawai the material which fills opposed through holes 4 is not *directly* bonded to each other, and thus is in non-contacting relation. However, Kawai clearly discloses on figure 12c the material that fills opposed through holes 4 is bonded to each other through 5 and 2. Note that claim 20 does not require the material that fills through holes be *directly* bonded.

Applicant's arguments with respect to claims 9 and 20 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 308-7382 for regular communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JN

August 15, 2002

A handwritten signature in black ink, appearing to read 'Eddie Lee', with a large, sweeping initial 'E'.

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800